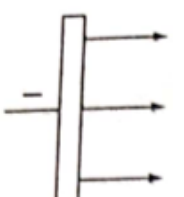
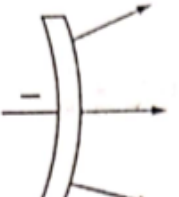

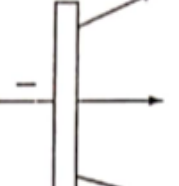




1. Gases are bad conductors of electricity. Their conductivity may be increased by
 - (a) increasing the pressure as well as potential difference between the electrodes.
 - (b) decreasing the pressure as well as potential difference between the electrodes.
 - (c) increasing the pressure and/or increasing the potential difference between the electrodes.
 - (d) increasing the pressure and/or decreasing the potential difference between the electrodes.
2. Which of the following is true for cathode ray?
 - (a) It is not deflected by magnetic field.
 - (b) It is an electromagnetic wave.
 - (c) It emits X-ray, when strikes a metal.
 - (d) It consist all the negative particles present in the atoms.
3. The specific charge of cathode rays
 - (a) depends on the nature of the gas.
 - (b) depends on the material of the discharge tube.
4. (c) depends on the potential difference between cathode and anode.
(d) is a universal constant.
5. Which of the following is not a fundamental particle?
 - (a) Electron
 - (b) Proton
 - (c) Neutron
 - (d) X-rays
6. The presence of charge particles in the atoms was first confirmed by
 - (a) Rutherford
 - (b) Thomson
 - (c) Faraday
 - (d) Goldstein
7. From the discharge tube experiment, it is concluded that
 - (a) mass of proton is fractional.
 - (b) matter contains electrons.
 - (c) matter contains nucleus.
 - (d) positive rays are heavier than protons.
8. The cathode rays experiment demonstrated that
 - (a) α -particles are the nuclei of He atoms.
 - (b) the e/m ratio for the particles of the cathode rays varies gas to gas.
 - (c) cathode rays are streams of negatively charged particles.
 - (d) the mass of an atom is essentially all contained in its very small nucleus.

8. Which of the following is not the possible path of cathode rays ejecting from the surface of cathode?
- (a)  (b) 
- (c)  (d) 
9. Cathode rays are made up of electrons. Anode rays are made up of
- (a) only protons.
 (b) only nucleus of atoms.
 (c) positive residue of atoms.
 (d) only from all the positive particles present in the atoms.
10. Which of the following is incorrect statement?
- (a) Cathode rays are emitted out from the surface of cathode.
 (b) Cathode rays travel in straight line.
 (c) Anode rays are heavier than cathode rays.
 (d) Anode rays are emitted out from the anode surface of anode.
11. The e/m ratio of anode rays produced in the discharge tube, depends on the
- (a) nature of the gas filled in the tube
 (b) nature of anode material
 (c) nature of cathode material
 (d) all of these
12. When lithium vapours were filled in the discharge tube for anode rays experiment, the anode rays were found to contain only Li^+ ions ($A = 7$, $Z = 3$). Each particle of anode ray is, therefore, containing
- (a) 1 proton only
 (b) 3 protons and 4 neutrons only
 (c) 3 protons, 4 neutrons and 2 electrons
 (d) 3 protons, 3 neutrons and 3 electrons
13. In an oil drop experiment, the following charges (in arbitrary units) were found on a series of oil droplets: 4.5×10^{-18} , 3.0×10^{-18} , 6.0×10^{-18} , 7.5×10^{-18} , 9.0×10^{-18} . The charge on electron (in the same unit) should be
- (a) 3.0×10^{-18}
 (b) 9.0×10^{-18}
 (c) 1.5×10^{-18}
 (d) 1.6×10^{-19}
15. Which of the following particle is not deflected in the magnetic field?
- (a) Electron
 (b) Proton
 (c) Neutron
 (d) Deuteron
17. The e/m ratio is maximum for
- (a) Na^+
 (b) Al^{3+}
 (c) H^+
 (d) Mg^{2+}
18. The potential difference between cathode and anode in a cathode ray tube is V . The speed acquired by the electrons is proportional to
- (a) V
 (b) \sqrt{V}
 (c) V^2
 (d) $1/\sqrt{V}$
19. The ratio of specific charges of α -particle and deuteron is
- (a) 1:2
 (b) 2:1
 (c) 1:1
 (d) 4:1
20. e/m ratio of a particle of charge 2 unit and mass 4 amu is
- (a) $4.8 \times 10^7 \text{ C/kg}$
 (b) 0.5 C/kg
 (c) $4.8 \times 10^4 \text{ C/kg}$
 (d) $8 \times 10^{29} \text{ C/kg}$

21. Atoms have void spaces. It was first suggested by
 - (a) Rutherford
 - (b) Thomson
 - (c) Lenard
 - (d) Dalton
22. Rutherford's experiment, which established the nuclear model of the atom, used a beam of
 - (a) α -particles, which impinged on a metal foil and got absorbed.
 - (b) γ -rays, which impinged on a metal foil and ejected electrons.
 - (c) helium atoms, which impinged on a metal foil and got scattered.
 - (d) helium nuclei, which impinged on a metal foil and got scattered.
23. Which of the following is not a conclusion of Rutherford's atomic model?
 - (a) Most of the part inside an atom is empty.
 - (b) Almost all mass of an atom is concentrated in the nucleus.
 - (c) The size of nucleus is very small in comparison to the size of atom.
 - (d) Electron revolves round the nucleus in definite orbits.
24. Which of the following is not a correct statement according to Rutherford's atomic model?
 - (a) 99% of mass of an atom is centred in the nucleus.
 - (b) Most of the part inside the atom is empty.
 - (c) The size of nucleus is very small in comparison to the atoms.
 - (d) Electrons revolve round the nucleus.
25. When β -particles are sent through a thin metal foil, most of them go straight through the foil as
 - (a) β -particles are much heavier than electron
 - (b) most part of the atom is empty space

- (c) β -particles are positively charged
- (d) β -particles moves with high velocity
26. A proton and a deuteron are projected towards the stationary gold nucleus, in different experiments, with the same speed. The distance of closest approach will be
 - (a) same for both
 - (b) greater for proton
 - (c) greater for deuteron
 - (d) depends on speed
27. Two particles, A and B, having same elm ratio are projected towards silver nucleus, in different experiments, with the same speed. The distance of closest approach will be
 - (a) same for both
 - (b) greater for A
 - (c) greater for B
 - (d) depends on speed
28. α -particles are projected towards the nucleus of following metals, with the same kinetic energy. Towards which metal, the distance of closest approach will be minimum?
 - (a) Cu ($Z = 29$)
 - (b) Ag ($Z = 47$)
 - (c) Au ($Z = 79$)
 - (d) Ca ($Z = 20$)
29. In the different experiments, α -particles, proton, deuteron and neutron are projected towards gold nucleus with the same kinetic energy. The distance of closest approach will be minimum for
 - (a) α -particle
 - (b) proton
 - (c) deuteron
 - (d) neutron
30. The following charged particles accelerated from rest, through the same potential difference, are projected towards gold nucleus in different experiments. The distance of closest approach will be maximum for

- (a) α -particle
(b) proton
(c) deuteron
(d) same for all

31. In the Rutherford scattering experiment, the number of alpha particles scattered at an angle $\theta = 60^\circ$ is 36 per minute. The number of alpha particles per minute scattered at angles $\theta = 90^\circ$ is (Assume all other conditions to be identical.)
- (a) 144 (b) 9
(c) 36 (d) 16
32. If nucleus and atom are considered as perfect spheres with the diameters 4×10^{-15} m and 2×10^{-10} m, respectively, then the ratio of the volumes of nucleus and atom should be
- (a) $2 \times 10^{-5}:1$ (b) $8 \times 10^{-15}:1$
(c) $1.25 \times 10^{14}:1$ (d) $8 \times 10^{15}:1$
33. With what velocity should an α -particle travel towards the nucleus of a copper

atoms so as to arrive at a distance 10^{-13} m from the nucleus of the copper atom?
 $(4.8 \times \sqrt{29 \times 60} = 200, N_A = 6 \times 10^{23})$

- (a) $2 \times 10^3 \text{ ms}^{-1}$
(b) $4 \times 10^{10} \text{ ms}^{-1}$
(c) $2 \times 10^5 \text{ ms}^{-1}$
(d) $2 \times 10^7 \text{ ms}^{-1}$
34. An α -particle accelerated through V volt is fired towards a nucleus. Its distance of closest approach is r . If a proton accelerated through the same potential is fired towards the same nucleus, the distance of closest approach of the proton will be
- (a) r (b) $2r$
(c) $r/2$ (d) $r/4$
35. The distance of closest approach of an α -particle fired towards a nucleus with momentum 'P' is r . What will be the distance of closest approach when the momentum of the α -particle is $2P$?
- (a) $2r$ (b) $4r$
(c) $r/2$ (d) $r/4$